

Remarks

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 1-73 are pending in the application, with 1, 27, 40, 53 and 67- 71 being the independent claims. Claims 1- 3, 26, 27, 40, 53-57, 59, 60-64 and 66-71 are amended. Claims 58 and 65 are canceled. Claims 72 and 73 are newly added. These amendments are believed to introduce no new matter, and their entry is respectfully requested.

Claims 54, 59, 60 and 64 are objected because of the minor informalities.

Claims 2, 3, 26, 53, 61-63, 65, 67 and 68 are rejected under 35 U.S.C. § 112, second paragraph.

Claims 1, 3, 6, 7, 9, 13-17, 19-32, 35-40, 42-45, 48-52, 54-58, 61-71 are rejected under 35 U.S.C. § 102(b) as being allegedly anticipated by Mahalingaiah et al.

Claims 5, 8, 10, 11, 30, 33, 46, 56 and 59 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Mahalingaiah et al.

Claims 2, 4, 18, 41 and 50 are rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Mahalingaiah et al. in view of view of Scott.

Based on the above amendments and the following remarks, Applicants respectfully request that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Objections to the claims

Claims 54, 59, 60 and 64 are objected because of minor informalities. The informalities are corrected by the amending the dependencies of claims 54, 59, 60 and 64. Accordingly, withdrawal of the objections is respectfully requested.

Rejections under 35 U.S.C. § 112, second paragraph

Claims 2 and 3 are rejected because of an antecedent basis problem. Claims 2 and 3 are amended to address this rejection. Accordingly, withdrawal of these rejections is respectfully requested.

Claim 26 is rejected because the limitation is allegedly not supported by the specification. This claim is amended to recite “IA-32”, instead of “X32”, recited in claim 26. The instructions mentioned in the claim are part of the Intel IA-32 instruction set, as is known to one of ordinary skill in the art (and the reference to X32 was intended to refer to it). Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

Claims 53, 61-63, 65, 67-71 are rejected because of allegedly improper use of “means-plus-function” language within the meaning of 35 U.S.C. § 112 (6). The rejection is respectfully traversed because Examiner appears to misinterpret the statute of 35 U.S.C. § 112 (6). Claims 53, 67 and 68 are also amended to comply with current 35 U.S.C. § 101 requirements and current US PTO guidelines regarding computer inventions. It is also worth noting, that the undersigned attorney has filed claims in this format on numerous occasions, and has never previously received such a rejection. Reconsideration of these rejections is respectfully requested.

Rejections under 35 U.S.C. § 102(b)

All of the independent claims stand rejected based on Mahalingaiah *et al.* under 35 U.S.C. § 102(b). Applicants have amended the claims to more clearly recite that patching, or changing, of the code takes place *at run-time* as the code is being executed by a processor of a computer. For a number of reasons, it may not be possible or desirable to stop the computer or currently running programs in order to reload the “patched” code. The independent claims 1, 27, 40, 53 and 67-71 have been amended to recite “*while the original instructions are being executed on a processor*” and “*while the original code is in the process of being executed on the processor.*” Support for these amendments can be found, for example, in paragraph 0024 and in FIG. 5 of the specification. “Patching” of the instructions *while they are being executed* patentably distinguishes the pending claims from Mahalingaiah.

The independent claims have been amended to recite that “the instructions are part of the instruction set of the processor available to a user.” This additionally distinguishes these claims from Mahalingaiah, which is directed to modifying microcode, not instructions available to a user, and not instructions that are part of the processor instruction set. Mahalingaiah specifically distinguishes its approach from instructions available to a user, see Mahalingaiah, column 3, lines 17 *et seq.*

Mahalingaiah does not disclose “patching” of the instructions at run-time as they are being executed, in fact, Mahalingaiah explicitly teaches the opposite – Mahalingaiah is directed to patching of microcode instructions – which are not visible or accessible to a user. In reality, the Mahalingaiah system is more relevant to hardware design correction than to software to patching. (In fact, the subject of microcode correction has been the subject of numerous disputes

between AMD, the owner of the Mahalingaiah patent, and Intel – however, microcode/hardware edits have no relevance to the present application, which is directed to patching of runtime code, not to patching of microcode).

In particular, Mahalingaiah discloses that

... instruction to be “patched” is fetched into a microcode unit. The microcode instruction unit invokes a patch microcode routine that dispatches a plurality of microcode instructions that cause a substitute microcode instructions stored in external memory to be loaded into patch data register. The microcode instruction unit then dispatches the substitute instruction stored in the patch data registers and the substitute instruction is executed in place of original instruction...

(See abstract and FIG. 4 of Mahalingaiah.) Thus, Mahalingaiah teaches a static method of substituting the instruction by fetching it into an allocated memory register. This process is completely different from the claimed approach, which does not fetch and store the instructions being executed. Instead, the original instructions are copied, the pseudooriginal code is created, and then this code is called to be executed as a part of the original code, which is *continuing to run without interruptions throughout the process*.

Therefore, Mahalingaiah not only does not anticipate the claimed invention, but teaches away from it by statically analyzing and replacing the fetched instructions. Therefore, amended independent claims 1, 27, 40, 53 and 67-71 are believed to be clearly allowable over Mahalingaiah.

Rejections under 35 U.S.C. § 103(a)

Claims 5, 8, 10, 11, 30, 33, 46, 56 and 59 stand rejected under 35 U.S.C. § 103(a) as being obvious over Mahalingaiah. Mahalingaiah does not render obvious the independent claims, since, as discussed earlier, Mahalingaiah does not teach or suggest run-time “patching” of the

instructions *while they are being executed*. Therefore, dependent claims 5, 8, 10, 11, 30, 33, 46, 56 and 59 are also not obvious over Mahalingaiah. Reconsideration of the rejections of these claims is respectfully requested.

Claims 2, 4, 18, 41 and 50 stand rejected under 35 U.S.C. § 103(a) as being obvious over Mahalingaiah in view of Scott. Neither Mahalingaiah nor Scott, alone or in combination, teach or suggest run-time “patching” of the instructions *while they are being executed*. Therefore, even a combination of Mahalingaiah and Scott does not render the claims 2, 4, 18, 41 and 50 obvious. Reconsideration of the rejections of these claims is respectfully requested.

New claims 72-73

New claims 72-73 have been added. New claims are believed to introduce no new matter. Support for these claims can be found in paragraph 0024 and in FIG. 5 of the specification.

Reconsideration of this Application and allowance of claims 1-57, 59-64, and 66-73 is respectfully requested.

Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,
BARDMESSER LAW GROUP
/GB/

George S. Bardmesser
Attorney for Applicants
Registration No. 44,020

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910 17th Street, N.W.
Suite 800
Washington, D.C. 20006
(202) 293-1191